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DEPARTMENT OF HEALTH & HUMAN SERVICES

23687
Public Health Service
Agency for Toxic Substances
and Disease Registry

Memorandum

Date December 12, 1985

From Acting Director
Office of Health Assessment, ATSDR

Subject Lee's Lane Landfill, SI 85-062A
Louisville, Kentucky

To Mr. Chuck Pietrosewicz
Public Health Advisor
EPA Region IV

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) requested guidance in the design of an air sampling strategy for assessing exposure to nearby residents of Lee's Lane Landfill, Louisville, Kentucky. A site visit was made on November 15, 1985, and a meeting was held on December 5, 1985, in Atlanta, Georgia. Subsequent telephone conversations with the regional Public Health Advisor and the EPA project manager resulted in the following air sampling strategy.

It was the consensus that exhaust stack, groundwater monitoring well, ambient residential, and inside residence air sampling would be conducted. These data would be collected by conventional (solid sorbents, gas chromatography/mass spectroscopy) sampling and analytical means. These data would be used to determine whether or not further sampling to characterize residential exposure would be necessary.

BACKGROUND

Lee's Lane Landfill is located on the banks of the Ohio River on the Kentucky side. The area is approximately 112 acres, and had been an active landfill since the 1940's. Dumping was prohibited in 1975. Due to the detection of explosive levels of methane in wells and gas leaks in residents' homes, a gas-venting and collection system was installed in 1980. A recent estimate indicated that the system is operating at about 50 percent of design efficiency. Odor complaints from residents have raised the issue of inhalation exposure to noxious gases emanating from the landfill.

A site visit was made on November 15, 1985, to meet with City of Louisville/Jefferson County health officials and

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USEPA officials regarding the design of an air sampling strategy for assessment of potential exposure to residents located near the Lee's Lane Landfill. A follow-up meeting was held in Atlanta, Georgia, on December 5, 1985. The list of attendees at both meetings is attached.

Subsequent to the decisions reached in these meetings, the sampling and analytical procedure was modified, based on a telephone conference with the EPA laboratory, to accommodate the capabilities of the EPA's Emergency Response Team (ERT) from Edison, New Jersey, who would be collecting and analyzing the samples.

SUMMARY

The following represents the consensus regarding the air sampling plan:

1. Sampling Period. Since environmental factors (wind direction, temperature, relative humidity) are a major concern, sampling will be conducted for 3 days a week for 2 (not necessarily consecutive) weeks, with the days spread out during the week. At least one sampling period will be at night. In addition, samples should be collected for a minimum 10-hour period. It is important to collect enough samples so that individual compounds can be quantitated.
2. Sampling Locations. Air sampling will be conducted in the main vent stack of the gas-venting system along the perimeter of the landfill, in the headspace of the groundwater monitoring wells located throughout the residential area, and in and around residences. Residences will be selected for sampling based on the following criteria: Proximity to the landfill; number of complaints received from the residence; the age (hence the potential for increased air exchange with the outside) for the residence; whether or not the residence has a basement, and other factors deemed important. Three "complaint" residences and two "noncomplaint" residences will be used. The same residences will be used throughout the 2-week period. In addition, air samples will be collected outside the selected residences at approximately the same time as those collected inside. Background samples will be collected in various areas upwind of the site, to identify ambient concentrations normally present and not attributable to the landfill.

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Monitoring well air space sampling will be done at three levels within the well each day of sampling.

Stack sampling of the gas-venting system will be done each day of sampling. These data will characterize the potential emissions from the landfill and will be used to compare to the measurements made in the residences.

3. Sampling Technique. ERT proposed to use their mobile SCIEK van which is equipped with a quadropole mass spectrometer. Direct injection of ambient pressure air is used. This instrumentation has a compound-specific limit of detection of approximately 0.01 parts per million. The major advantage to this technique is that it provides mobility (the probe can be moved from outdoors to indoors and from room to room) and real-time data are provided.

The disadvantages are as follows. The compound-identifying capabilities fall short of that of conventional solid sorbent tube/gas chromatography/mass spectroscopy. Five substances (benzene, trichloroethylene, vinyl chloride, dichloroethane, toluene, and xylene) have been identified as being present in previous data. Although the SCIEK unit can do a fairly good job of quantitating these compounds if a not too complex matrix is involved, we do not expect this to be the case. Many responses of unknown identity and quantity may result, from which a health assessment cannot be made. Therefore, we recommend that air sampling by solid sorbent (charcoal, tenax GC) be used. The sampling probe is limited in length due to wall losses and pressure drop. This may make it impossible to reach the gas-venting system stack or some of the depths in the monitoring wells.

4. Analysis. Qualitative and quantitative analysis should be provided by gas chromatography/mass spectroscopy. The concentration range of any remaining unknown peaks should be presented.
5. Supporting Information. Meteorological data (temperature, wind speed and direction, barometric pressure, relative humidity) will be collected for 1 week prior to and during each week of sampling. A chemical inventory from each residence will be compiled. This will seek to identify any other sources of chemicals within the home - hobbies, storage of liquids, prior cleaning or fumigations, etc.

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In order to evaluate the performance of the gas-venting system in controlling the concentrations of methane in the residences, real-time methane measurements will be collected.

6. Future Sampling. The purpose of the above outlined sampling strategy is to characterize the inhalation exposure potential of the local residents to emissions from the adjacent landfill. Based upon the results of this effort, the decision will be made whether or not further characterization is necessary.

We hope this information is useful to you.


for Stephen Margolis, Ph.D.

Date of Implementation is tentatively scheduled for the week of 1/13/86.

Continuous evaluation of the analysis ~~will~~ while sampling will determine during the sampling period will